Portable Indocyanine Green (ICG) detection system – intraoperative applications

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Important Information Before Submitting Your Abstract:
Begin Submission

Presentation Type:
Oral - General Abstract

Category:
Oncology

Oncology Sub-Category:
Oncology: First-in-Human & Clinical Studies

Title:
Portable Indocyanine Green (ICG) detection system – intraoperative applications

Abstract Body :

Objectives: Our previous optical imaging work allowed us to build a portable indocyanine green (ICG) detection system. Using ICG and 99mTc nanocolloid ICG (99mTc-N-ICG) (1) we were able to perform the following intraoperative procedures: breast cancer sentinel node detection, colon anastomosis surgery perfusion evaluation and parathyroid detection. The aim of the current study was to describe an upgraded ICG detection system (ICGDS) and results obtained during the described procedures.

Methods: The ICGDS has the specifications described in Table 1 and it was used in breast cancer sentinel node procedures. We performed 15 breast cancer sentinel node procedures using 99mTc-N-ICG. Injection of the tracer was performed perioareolar subcutaneously in the same quadrant of the tumor. Lymphoscintigrapy and SPECT-CT (Mediso) were acquired prior surgery. Intraoperative SN localization was performed using a gamma probe and ICGDS. Room lights were dimmed or turned off during ICGDS use. Intraoperative localization of SN was made using acoustic

cues from the probe that guided surgeon to the region where the node was located and later ICGD allowed to visually identify them. We performed 3 intraoperative perfusion evaluation of colon anastomosis. ICG was injected intravenously during surgery once anastomosis was performed, and perfusion was evaluated. We performed 2 intraoperative parathyroid detection procedures with ICG which was intravenously injected once thyroid tissue has been exposed and parathyroid search remained inconclusive.

Results: Our ICGDS allowed us to identify SLNs that were radioactive and fluorescent. We found that fluorescent imaging provided enhanced confidence to surgeon to precisely remove the relevant nodes, and spare non hybrid nodes, particularly when nodes were clustered. We did not found any radioactive only or fluorescent only nodes. All fluorescent nodes were radioactive. During anastomosis evaluation we were able to intraoperatively visualize perfusion of the different structures involved. We found that the 3 patients had good anastomosis perfusion and that information correlated with no postoperative complications. Intraoperative parathyroid fluorescence imaging allowed us to visualize parathyroid tissue and helped the surgeon to remove them.

Conclusion: Our portable ICG detection system was able to detect 99mTc-N-ICG and ICG. These procedures were safe and carried out without complications and allowed us to detect nodes, parathyroids and evaluate digestive perfusion. Advances in instrumentation and novel specific targeting fluorescent or hybrid tracers will improve patient outcomes.

References:

1. J Nucl Med May 2014 vol. 55 no. supplement 1 1447

Presenter Biography:

I am a MD MSc PHD Nuclear medicine physician, interested in diagnostic and therapeutic molecular imaging. Involved in the development of novel instrumentation and tracers for oncology imaging from preclinical to clinical trials. Interested in Radiotracers, Fluorescent imaging, hybrid tracers, intraoperative imaging, GHOST concept, interdisciplinary team development focused on oncology imaging.

Image Description:

Portable intraoperative Indocyanine Green Detection System

Keywords:

Hybrid Imaging,Nuclear/fluorescent Imaging,Oncological Imaging

Student Travel Stipend:

No, I decline

Young Investigator Award:

No, I decline

Women in Molecular Imaging Network Scholar Award:

No, I decline

Poster Award:

No, I decline

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